SPECIFICATION

# Submodel

# Technical Data for Switching Relays

1.0

08 November 2023

Submodel Template of the

Asset Adminstration Shell

# Imprint

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# Version history

| | | |
|---|---|---|
| 2023-11-08 | 1.0 | Release of the Submodel template |

# Content

# Foreword

In the realm of modern electronics and automation, the importance of reliable and efficient components cannot be overstated. Switching relays stand as the unsung heroes in countless applications, enabling the seamless control and automation of various electrical devices. As our world becomes increasingly interconnected and technology-driven, the need for these devices to work harmoniously, efficiently, and safely has never been greater.

This foreword aims to shed light on the pivotal role played by Switching Relays in our rapidly evolving technological landscape. These versatile devices serve as the cornerstone of automation, ensuring the smooth operation of systems in diverse sectors such as industrial manufacturing, energy management, transportation, and beyond. By providing a bridge between low and high-power circuits, relay switches enable intricate control processes, allowing for precise and reliable outcomes.

Reliability and safety are paramount in any application, and Switching Relays play a crucial role in upholding these standards. Engineers, technicians, and innovators worldwide rely on these components to design systems that power our homes, businesses, and industries. Standardization and innovation in relay technology have paved the way for enhanced performance, reduced energy consumption, and increased longevity, making these devices indispensable in the modern world.

This foreword serves as a tribute to the ingenuity of those who design, manufacture, and utilize Switching Relays. It is a testament to the collaborative efforts of the global engineering community, working tirelessly to ensure that these components meet the ever-growing demands of our interconnected world. As we navigate the complexities of the digital age, relay switches remain the unsung champions, quietly enabling the technology that drives progress.

We invite readers to delve into the pages that follow, exploring the intricate world of Switching Relays and appreciating the innovation and dedication that make these components the backbone of modern automation. As we celebrate the achievements of the past and look forward to a future filled with technological advancements, let us acknowledge the indispensable role played by Switching Relays in shaping our world.

# 1 General

## 1.1 About this document

This document is a part of a specification series. Each part specifies the contents of a Submodel template for the Asset Administration Shell (AAS). The AAS is described in [1-3] and [6]. First exemplary Submodel contents were described in [4], while the actual format of this document was derived by the "Administration Shell in Practice" [5]. The format aims to be very concise, giving only minimal necessary information for applying a Submodel template, while leaving deeper descriptions and specification of concepts, structures and mapping to the respective documents [1-6].

The target group of the specification are developers and editors of technical documentation and manufacturer information, which are describing assets in smart manufacturing by means of the Asset Administration Shell (AAS) and therefore need to create a Submodel instance with a hierarchy of SubmodelElements. This document especially details on the question, which SubmodelElements with which semantic identification shall be used for this purpose.

## 1.2 Scope of the Submodel

This Submodel template aims at interoperable provision of information describing Switching Relays in regard to the asset of the respective Asset Administration Shell. Central element is the provision of properties [7], ideally interoperable by the means of dictionaries such as ECLASS and IEC CDD (Common Data Dictionary). The purpose of this document is to make selected specifications of Submodels in such manner that information about assets can be exchanged in a meaningful way between partners in a value creation network.

The intended use-case is the provision of a standardized property structure for Switching Relays, which enables a more efficient and interoperable data exchange and communication.

This concept can serve as a basis for standardizing the respective Submodel. The conception is based on existing norms, studies of common practices at enterprises, directives and standards so that a far-reaching acceptance can be achieved.

## 1.3 Relevant standards and sources of concepts for the Submodel template

According to [3], interoperable properties might be defined by standards, consortium specifications or manufacturer specifications. Useful standards providing sources of concepts are:

Table 1: List of examplary standards defining interoperable properties

| | |
|---|---|
| IEC 6181-1 | Fundamental description of relays |
| IEC 61360 –<br>-1, -2, -4, -6 | IEC CDD Content for relays |
| IEC 62683 | Low-voltage switchgear and control gear |

So called property dictionaries are used identify information elements (see Terms and Definitions of [6]). Such property dictionaries include:

- ECLASS, see: https://www.eclasscontent.com/
- IEC CDD, see: https://cdd.iec.ch/cdd/iec61987/iec61987.nsf and https://cdd.iec.ch/cdd/iec62683/cdddev.nsf

In this document, properties are aimed to be described by ECLASS.

# 2 Information set for Submodel Contact Information

While defining Submodels the following three aspects must be considered as suggested in [5]:

**Use and economic relevance**

This AAS submodel provides a proof of concept that the technical description of switching relays can be mapped in an AAS submodel. This is an initial version that needs to be expanded. Nonetheless, an initial digital product description provides a data container with semantic structures from ECLASS as a form to enable the digital and efficient exchange of data beyond manual PDF data sheets.

**Property specification**

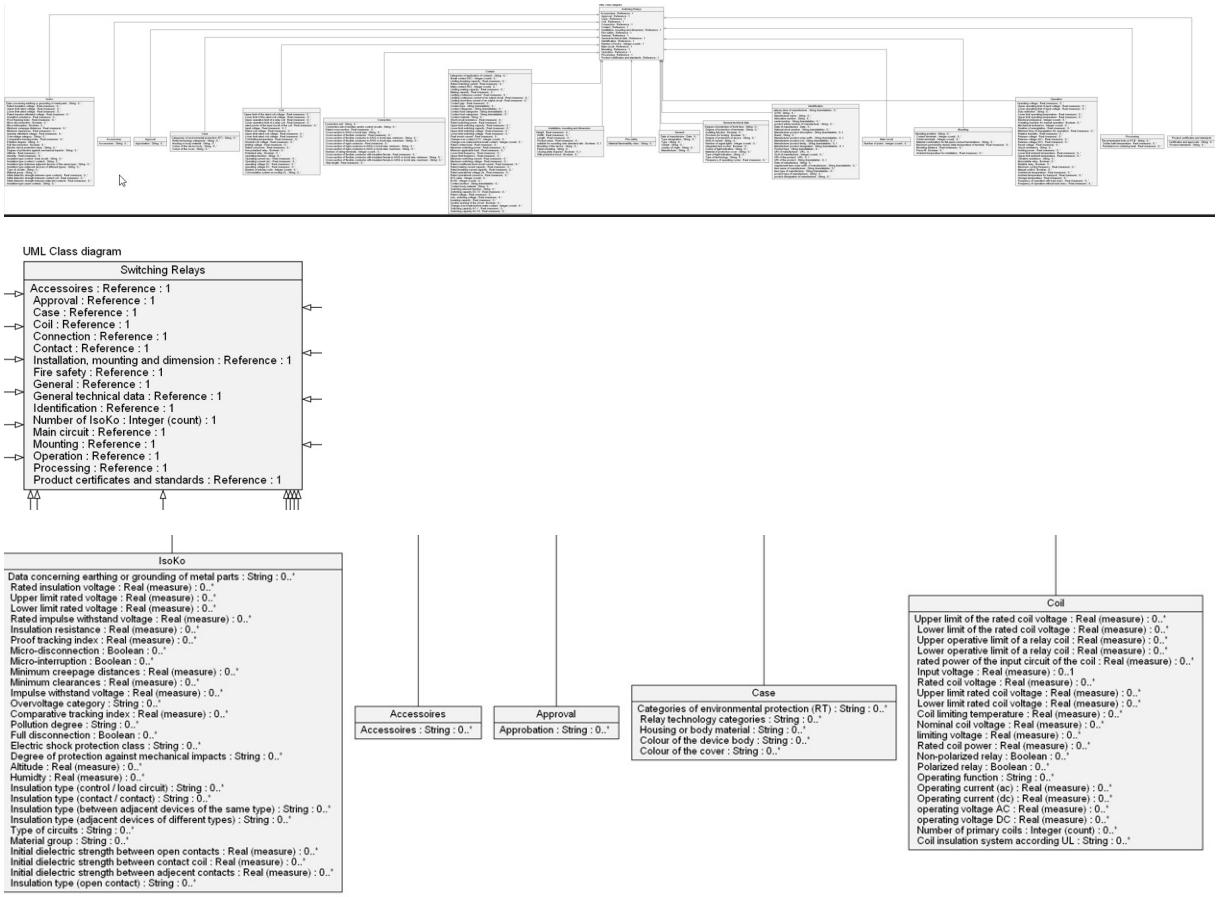
See section 3 Submodel and Collections.

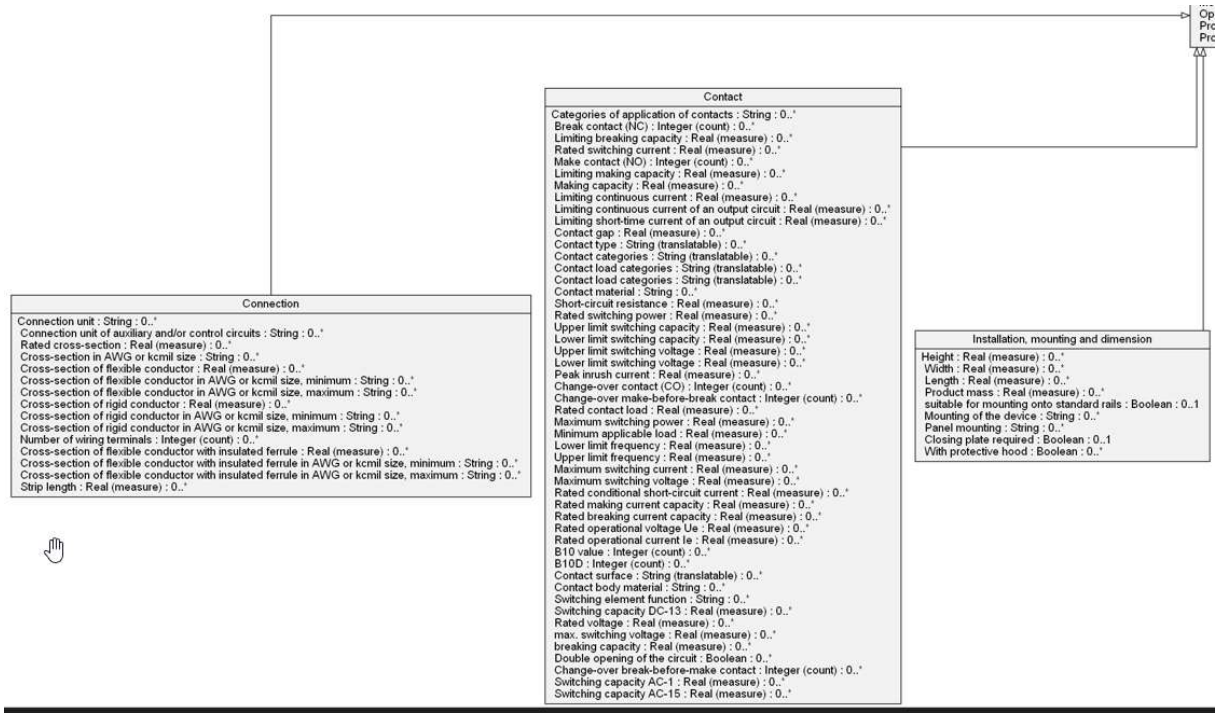
# 3 Submodel and Collections

## 3.1 Properties of the Submodel “Switching Relays”

The figure below shows the UML-diagram defining the relevant properties which need to be set. Table  describes the details of the Submodel structure combined with examples.

Figure 1: UML-Diagram for Submodel " Switching Relays"




Contact
Categories of application of contacts : String : 0..*
Break contact (NC) : Integer (count) : 0..*
Limiting breaking capacity : Real (measure) : 0..*
Rated switching current : Real (measure) : 0..*
Make contact (NO) : Integer (count) : 0..*
Limiting making capacity : Real (measure) : 0..*
Making capacity : Real (measure) : 0..*
Limiting continuous current : Real (measure) : 0..*
Limiting continuous current of an output circuit : Real (measure) : 0..*
Limiting short-time current of an output circuit : Real (measure) : 0..*
Contact gap : Real (measure) : 0..*
Contact type : String (translatable) : 0..*
Contact categories : String (translatable) : 0..*
Contact load categories : String (translatable) : 0..*
Contact load categories : String (translatable) : 0..*
Contact material : String : 0..*
Short-circuit resistance : Real (measure) : 0..*
Rated switching power : Real (measure) : 0..*
Upper limit switching capacity : Real (measure) : 0..*
Lower limit switching capacity : Real (measure) : 0..*
Upper limit switching voltage : Real (measure) : 0..*
Lower limit switching voltage : Real (measure) : 0..*
Peak inrush current : Real (measure) : 0..*
Change-over contact (CO) : Integer (count) : 0..*
Change-over make-before-break contact : Integer (count) : 0..*
Rated contact load : Real (measure) : 0..*
Maximum switching power : Real (measure) : 0..*
Minimum applicable load : Real (measure) : 0..*
Lower limit frequency : Real (measure) : 0..*
Upper limit frequency : Real (measure) : 0..*
Maximum switching current : Real (measure) : 0..*
Maximum switching voltage : Real (measure) : 0..*
Rated conditional short-circuit current : Real (measure) : 0..*
Rated making current capacity : Real (measure) : 0..*
Rated breaking current capacity : Real (measure) : 0..*
Rated operational voltage Ue : Real (measure) : 0..*
Rated operational current Ie : Real (measure) : 0..*
B10 value : Integer (count) : 0..*
B10D : Integer (count) : 0..*
Contact surface : String (translatable) : 0..*
Contact body material : String : 0..*
Switching element function : String : 0..*
Switching capacity DC-13 : Real (measure) : 0..*
Rated voltage : Real (measure) : 0..*
max. switching voltage : Real (measure) : 0..*
breaking capacity : Real (measure) : 0..*
Double opening of the circuit : Boolean : 0..*
Change-over break-before-make contact : Integer (count) : 0..*
Switching capacity AC-1 : Real (measure) : 0..*
Switching capacity AC-15 : Real (measure) : 0..*
Connection
Connection unit : String : 0..*
Connection unit of auxiliary and/or control circuits : String : 0..*
Rated cross-section : Real (measure) : 0..*
Cross-section in AWG or kcmil size : String : 0..*
Cross-section of flexible conductor : Real (measure) : 0..*
Cross-section of flexible conductor in AWG or kcmil size, minimum : String : 0..*
Cross-section of flexible conductor in AWG or kcmil size, maximum : String : 0..*
Cross-section of rigid conductor : Real (measure) : 0..*
Cross-section of rigid conductor in AWG or kcmil size, minimum : String : 0..*
Cross-section of rigid conductor in AWG or kcmil size, maximum : String : 0..*
Number of wiring terminals : Integer (count) : 0..*
Cross-section of flexible conductor with insulated ferrule : Real (measure) : 0..*
Cross-section of flexible conductor with insulated ferrule in AWG or kcmil size, minimum : String : 0..*
Cross-section of flexible conductor with insulated ferrule in AWG or kcmil size, maximum : String : 0..*
Strip length : Real (measure) : 0..*
Installation, mounting and dimension
Height : Real (measure) : 0..*
Width : Real (measure) : 0..*
Length : Real (measure) : 0..*
Product mass : Real (measure) : 0..*
suitable for mounting onto standard rails : Boolean : 0..1
Mounting of the device : String : 0..*
Panel mounting : String : 0..*
Closing plate required : Boolean : 0..1
With protective hood : Boolean : 0..*

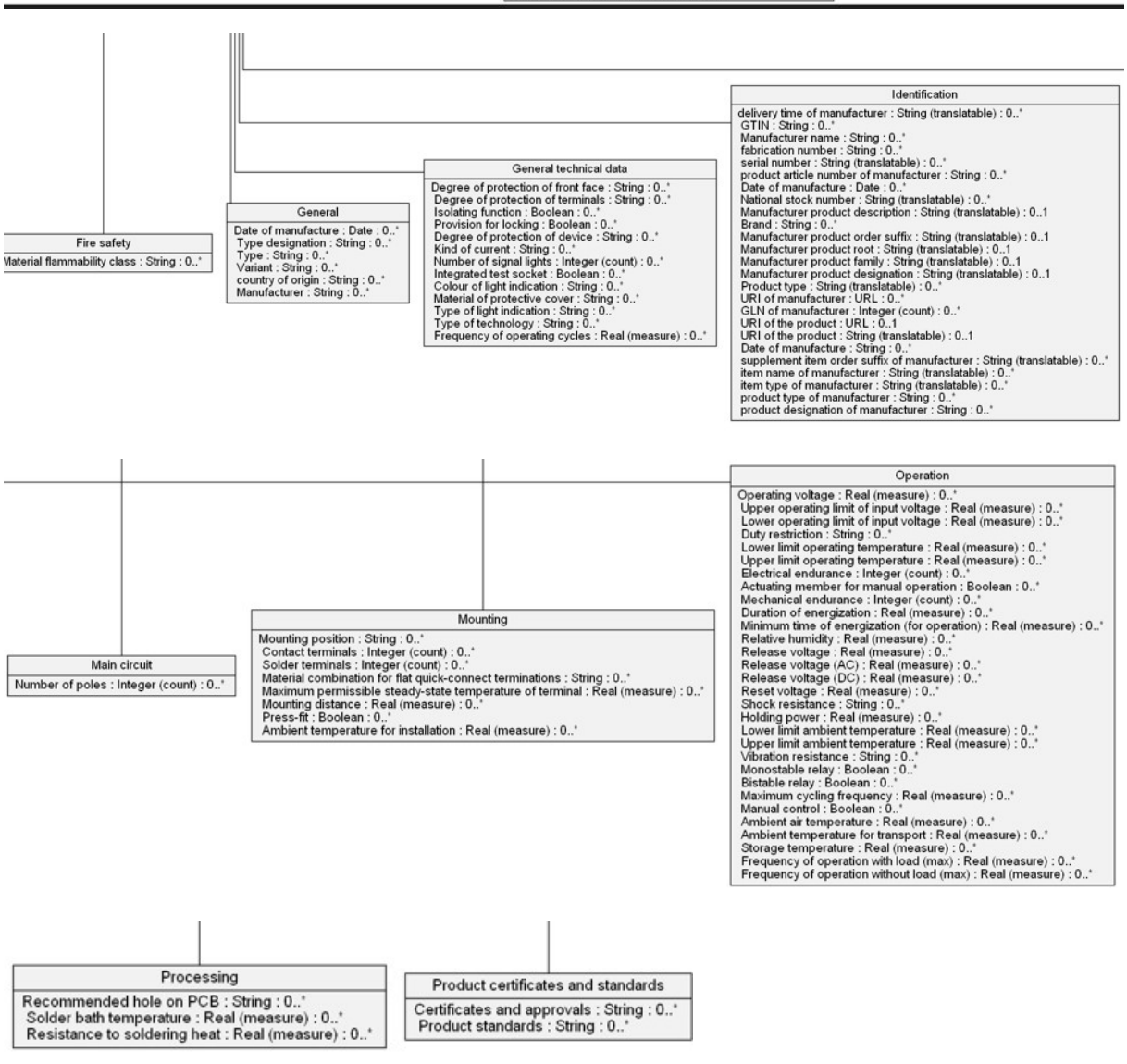

Identification
delivery time of manufacturer : String (translatable) : 0..*
GTIN : String : 0..*
Manufacturer name : String : 0..*
fabrication number : String : 0..*
serial number : String (translatable) : 0..*
product article number of manufacturer : String : 0..*
Date of manufacture : Date : 0..*
National stock number : String (translatable) : 0..*
Manufacturer product description : String (translatable) : 0..1
Brand : String : 0..*
Manufacturer product order suffix : String (translatable) : 0..1
Manufacturer product root : String (translatable) : 0..1
Manufacturer product family : String (translatable) : 0..1
Manufacturer product designation : String (translatable) : 0..1
Product type : String (translatable) : 0..*
URI of manufacturer : URL : 0..*
GLN of manufacturer : Integer (count) : 0..*
URI of the product : URL : 0..1
URI of the product : String (translatable) : 0..1
Date of manufacture : String : 0..*
supplement item order suffix of manufacturer : String (translatable) : 0..*
item name of manufacturer : String (translatable) : 0..*
item type of manufacturer : String (translatable) : 0..*
product type of manufacturer : String : 0..*
product designation of manufacturer : String : 0..*
General technical data
Degree of protection of front face : String : 0..*
Degree of protection of terminals : String : 0..*
Isolating function : Boolean : 0..*
Provision for locking : Boolean : 0..*
Degree of protection of device : String : 0..*
Kind of current : String : 0..*
Number of signal lights : Integer (count) : 0..*
Integrated test socket : Boolean : 0..*
Colour of light indication : String : 0..*
Material of protective cover : String : 0..*
Type of light indication : String : 0..*
Type of technology : String : 0..*
Frequency of operating cycles : Real (measure) : 0..*
General
Date of manufacture : Date : 0..*
Type designation : String : 0..*
Type : String : 0..*
Variant : String : 0..*
country of origin : String : 0..*
Manufacturer : String : 0..*
Fire safety
Material flammability class : String : 0..*
Operation
Operating voltage : Real (measure) : 0..*
Upper operating limit of input voltage : Real (measure) : 0..*
Lower operating limit of input voltage : Real (measure) : 0..*
Duty restriction : String : 0..*
Lower limit operating temperature : Real (measure) : 0..*
Upper limit operating temperature : Real (measure) : 0..*
Electrical endurance : Integer (count) : 0..*
Actuating member for manual operation : Boolean : 0..*
Mechanical endurance : Integer (count) : 0..*
Duration of energization : Real (measure) : 0..*
Minimum time of energization (for operation) : Real (measure) : 0..*
Relative humidity : Real (measure) : 0..*
Release voltage : Real (measure) : 0..*
Release voltage (AC) : Real (measure) : 0..*
Release voltage (DC) : Real (measure) : 0..*
Reset voltage : Real (measure) : 0..*
Shock resistance : String : 0..*
Holding power : Real (measure) : 0..*
Lower limit ambient temperature : Real (measure) : 0..*
Upper limit ambient temperature : Real (measure) : 0..*
Vibration resistance : String : 0..*
Monostable relay : Boolean : 0..*
Bistable relay : Boolean : 0..*
Maximum cycling frequency : Real (measure) : 0..*
Manual control : Boolean : 0..*
Ambient air temperature : Real (measure) : 0..*
Ambient temperature for transport : Real (measure) : 0..*
Storage temperature : Real (measure) : 0..*
Frequency of operation with load (max) : Real (measure) : 0..*
Frequency of operation without load (max) : Real (measure) : 0..*
Mounting
Mounting position : String : 0..*
Contact terminals : Integer (count) : 0..*
Solder terminals : Integer (count) : 0..*
Material combination for flat quick-connect terminations : String : 0..*
Maximum permissible steady-state temperature of terminal : Real (measure) : 0..*
Mounting distance : Real (measure) : 0..*
Press-fit : Boolean : 0..*
Ambient temperature for installation : Real (measure) : 0..*
Main circuit
Number of poles : Integer (count) : 0..*
Processing
Recommended hole on PCB : String : 0..*
Solder bath temperature : Real (measure) : 0..*
Resistance to soldering heat : Real (measure) : 0..*
Product certificates and standards
Certificates and approvals : String : 0..*
Product standards : String : 0..*

Table 2: Properties of Submodel “Switching Relays"

| **idShort** | *Switching Relays* | | |
|---|---|---|---|
| **Class** | Submodel | | |
| **semanticId** | 0173-EX-1#01-ABI969#001 | | |
| **Explanation** | | | |
| **[SME type]** | **semanticId = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Accessoires | [IRDI] 0173-EX-1#02-CJV876#001 | [REFERENCE] | 1 |
| [Property] Approval | [IRDI] 0173-EX-1#02-SWE350#001 | [REFERENCE] | 1 |
| [Property] Case | [IRDI] 0173-EX-1#02-BXT746#001 | [REFERENCE] | 1 |
| [Property] Coil | [IRDI] 0173-EX-1#02-XZV809#001 | [REFERENCE] | 1 |
| [Property] Connection | [IRDI] 0173-EX-1#02-SPY810#001 | [REFERENCE] | 1 |
| [Property] Contact | [IRDI] 0173-EX-1#02-XGE201#001 | [REFERENCE] | 1 |
| [Property] Installation_mounting \ _and_dimension | [IRDI] 0173-EX-1#02-EON193#001 | [REFERENCE] | 1 |
| [Property] Fire_safety | [IRDI] 0173-EX-1#02-PUZ306#001 | [REFERENCE] | 1 |
| [Property] General | [IRDI] 0173-EX-1#02-SPA352#001 | [REFERENCE] | 1 |
| [Property] General_technical_data | [IRDI] 0173-EX-1#02-DVI205#001 | [REFERENCE] | 1 |
| [Property] Identification | [IRDI] 0173-EX-1#02-ERI312#001 | [REFERENCE] | 1 |

| | | | |
|---|---|---|---|
| [Property] Number_of_IsoKo | [IRDI] 0173-EX-1#02-KLQ590#001 | [INTEGER_COUNT] | 1 |
| [Property] Main_circuit | [IRDI] 0173-EX-1#02-ZYM448#001 | [REFERENCE] | 1 |
| [Property] Mounting | [IRDI] 0173-EX-1#02-NJT502#001 | [REFERENCE] | 1 |
| [Property] Operation | [IRDI] 0173-EX-1#02-OEV459#001 | [REFERENCE] | 1 |
| [Property] Processing | [IRDI] 0173-EX-1#02-RYY045#001 | [REFERENCE] | 1 |
| [Property] Product_certificates \ _and_standards | [IRDI] 0173-EX-1#02-VRA872#001 | [REFERENCE] | 1 |

## 3.2 Properties of the SMC “Product certificates and standards”

Figure 1 shows the UML-diagram defining the relevant properties which need to be set. The following table describes the details of the SMC structure combined with examples.

Table 3: Properties of SMC " Product certificates and standards "

| **idShort** | *Product_certificates_and_standards* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-VRA872#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Certificates_and_approvals | [IRDI] 0173-EX-1#02-BEG605#001 | [STRING] | 0..* |
| [Property] Product_standards | [IRDI] 0173-EX-1#02-KYW490#001 | [STRING] | 0..* |

## 3.3 Properties of the SMC “Processing”

Table 4: Properties of SMC " Processing"

| **idShort** | *Processing* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-RYY045#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Recommended_hole_on_PCB | [IRDI] 0173-EX-1#02-TVT944#001 | [STRING] | 0..* |
| [Property] Solder_bath_temperature | [IRDI] 0173-EX-1#02-YVB699#001 | [REAL_MEASURE] | 0..* |
| [Property] Resistance_to_soldering_heat_ | [IRDI] 0173-EX-1#02-SKY615#001 | [REAL_MEASURE] | 0..* |

## 3.4 Properties of the SMC “Operation”

Table 5: Properties of SMC "Operation"

| **idShort** | *Operation* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-OEV459#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Operating_voltage | [IRDI] 0173-EX-1#02-RGO977#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_operating_limit \ | [IRDI] 0173-EX-1#02-EUX620#001 | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| _of_input_voltage | | | |
| [Property] Lower_operating_limit \ _of_input_voltage | [IRDI] 0173-EX-1#02-JEB045#001 | [REAL_MEASURE] | 0..* |
| [Property] Duty_restriction | [IRDI] 0173-EX-1#02-ANS624#001 | [STRING] | 0..* |
| [Property] Lower_limit_operating \ _temperature | [IRDI] 0173-EX-1#02-HVE307#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_operating \ _temperature | [IRDI] 0173-EX-1#02-UEY089#001 | [REAL_MEASURE] | 0..* |
| [Property] Electrical_endurance | [IRDI] 0173-EX-1#02-BEX652#001 | [INTEGER_COUNT] | 0..* |
| [Property] Actuating_member_for \ _manual_operation | [IRDI] 0173-EX-1#02-ZSX082#001 | [BOOLEAN] | 0..* |
| [Property] Mechanical_endurance | [IRDI] 0173-EX-1#02-BIG365#001 | [INTEGER_COUNT] | 0..* |
| [Property] Duration_of_energization | [IRDI] 0173-EX-1#02-YIR750#001 | [REAL_MEASURE] | 0..* |
| [Property] Minimum_time_of_ \ energization_for_operation_ | [IRDI] 0173-EX-1#02-RBX256#001 | [REAL_MEASURE] | 0..* |
| [Property] Relative_humidity | [IRDI] 0173-EX-1#02-DGH027#001 | [REAL_MEASURE] | 0..* |
| [Property] Release_voltage | [IRDI] 0173-EX-1#02-PQM488#001 | [REAL_MEASURE] | 0..* |
| [Property] Release_voltage_AC_ | [IRDI] 0173-EX-1#02-THZ349#001 | [REAL_MEASURE] | 0..* |
| [Property] Release_voltage_DC_ | [IRDI] 0173-EX-1#02-LAY400#001 | [REAL_MEASURE] | 0..* |
| [Property] Reset_voltage | [IRDI] 0173-EX-1#02-JIZ748#001 | [REAL_MEASURE] | 0..* |
| [Property] Shock_resistance_ | [IRDI] 0173-EX-1#02-OVB862#001 | [STRING] | 0..* |
| [Property] Holding_power | [IRDI] 0173-EX-1#02-PLB462#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_ambient \ _temperature | [IRDI] 0173-EX-1#02-MIG765#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_ambient \ | [IRDI] 0173-EX-1#02-ABY945#001 | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| _temperature | | | |
| [Property] Vibration_resistance_ | [IRDI] 0173-EX-1#02-CIP023#001 | [STRING] | 0..* |
| [Property] Monostable_relay | [IRDI] 0173-EX-1#02-NQE200#001 | [BOOLEAN] | 0..* |
| [Property] Bistable_relay | [IRDI] 0173-EX-1#02-CHY553#001 | [BOOLEAN] | 0..* |
| [Property] Maximum_cycling_frequency | [IRDI] 0173-EX-1#02-NNA358#001 | [REAL_MEASURE] | 0..* |
| [Property] Manual_control | [IRDI] 0173-EX-1#02-AJO571#001 | [BOOLEAN] | 0..* |
| [Property] Ambient_air_temperature | [IRDI] 0173-EX-1#02-XSE076#001 | [REAL_MEASURE] | 0..* |
| [Property] Ambient_temperature \ _for_transport | [IRDI] 0173-EX-1#02-DKG336#001 | [REAL_MEASURE] | 0..* |
| [Property] Storage_temperature | [IRDI] 0173-EX-1#02-XMU966#001 | [REAL_MEASURE] | 0..* |
| [Property] Frequency_of_operation \ _with_load_max_ | [IRDI] 0173-EX-1#02-FUD987#001 | [REAL_MEASURE] | 0..* |
| [Property] Frequency_of_operation \ _without_load_max_ | [IRDI] 0173-EX-1#02-PJW697#001 | [REAL_MEASURE] | 0..* |

## 3.5 Properties of the SMC “Mounting”

Table 6: Properties of SMC "Mounting"

| **idShort** | *Mounting* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-NJT502#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Mounting_position | [IRDI] 0173-EX-1#02-WEP057#001 | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Contact_terminals | [IRDI] 0173-EX-1#02-YVT404#001 | [INTEGER_COUNT] | 0..* |
| [Property] Solder_terminals | [IRDI] 0173-EX-1#02-CXP840#001 | [INTEGER_COUNT] | 0..* |
| [Property] Material_combination_for_flat \ _quick_connect_terminations | [IRDI] 0173-EX-1#02-UYK133#001 | [STRING] | 0..* |
| [Property] Maximum_permissible_steady \ _state_temperature_of_terminal | [IRDI] 0173-EX-1#02-ROG128#001 | [REAL_MEASURE] | 0..* |
| [Property] Mounting_distance | [IRDI] 0173-EX-1#02-PIS618#001 | [REAL_MEASURE] | 0..* |
| [Property] Press_fit | [IRDI] 0173-EX-1#02-IZG860#001 | [BOOLEAN] | 0..* |
| [Property] Ambient_temperature_for_installation | [IRDI] 0173-EX-1#02-BVQ881#001 | [REAL_MEASURE] | 0..* |

## 3.6 Properties of the SMC “Main circuit”

Table 7: Properties of SMC "Main circuit"

| **idShort** | *Main_circuit* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-ZYM448#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Number_of_poles | [IRDI] 0173-EX-1#02-OYD244#001 | [INTEGER_COUNT] | 0..* |

## 3.7 Properties of the SMC “Identification”

Table 8: Properties of SMC "Identification"

| **idShort** | *Identification* |
|---|---|
| **Class** | SubmodelElementCollection |

| **semanticId** | 0173-EX-1#02-ERI312#001 | | |
|---|---|---|---|
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] delivery_time_of_manufacturer | [IRDI] 0173-1#02-AAM555#002 duration per working days needed by the manufacturer to deliver the product beginning with the receipt of the order | [STRING_TRANSLATABLE_] | 0..* |
| [Property] GTIN | [IRDI] 0173-1#02-AAO663#003 internationally unique and unambiguous article number for products and services (Global Trade Item Number) | [STRING] | 0..* |
| [Property] Manufacturer_name | [IRDI] 0173-1#02-AAO677#002 legally valid designation of the natural or judicial person which is directly responsible for the design, production, packaging and labeling of a product in respect to its being brought into circulation | [STRING] | 0..* |
| [Property] fabrication_number | [IRDI] 0173-1#02-AAO674#004 alphanumeric character sequence assigned to a fabricated product, which allows the date, time and circumstances of | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| | fabrication to be traced | | |
| [Property] serial_number | [IRDI] 0173-1#02-AAM556#002 unique combination of numbers and letters used to identify the device once it has been manufactured | [STRING_TRANSLATABLE_] | 0..* |
| [Property] product_article_number \ _of_manufacturer | [IRDI] 0173-1#02-AAO676#003 unique product identifier of the manufacturer | [STRING] | 0..* |
| [Property] Date_of_manufacture | [IRDI] 0173-1#02-AAR972#002 Date from which the production and / or development process is completed or from which a service is provided completely | [DATE] | 0..* |
| [Property] National_stock_number | [IRDI] 0173-1#02-AAN075#003 13-digit numeric code, identifying all the standardized material items of supply as they have been recognized by the United States Department of Defense | [STRING_TRANSLATABLE_] | 0..* |
| [Property] Manufacturer_product_description | [IRDI] 0173-1#02-AAU734#001 Description of the product, it's technical features and implementation if needed (long text) | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Brand | [IRDI] 0173-1#02-AAO742#002 Part of the naming for the support and the recognition of the brand position of products and services consisting | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| | of words, numbers, letters or other characters. Registered brands and trademarks are indicated with the appropriate protective signs (® or TM) | | |
| [Property] Manufacturer_product_order_suffix | [IRDI] 0173-1#02-AAU733#001 By the manufacturer awarded string for the identification of additional attributes, not by a structured manufacturer item number may be expressed | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Manufacturer_product_root | [IRDI] 0173-1#02-AAU732#001 Top level of a 3 level manufacturer specific product hierarchy | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Manufacturer_product_family | [IRDI] 0173-1#02-AAU731#001 2nd level of a 3 level manufacturer specific product hierarchy | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Manufacturer_product_designation | [IRDI] 0173-1#02-AAW338#001 Short description of the product (short text) | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Product_type | [IRDI] 0173-1#02-AAO057#002 Characteristic to differentiate between different products of a product family or special variants | [STRING_TRANSLATABLE_] | 0..* |
| [Property] URI_of_manufacturer | [IRDI] 0173-1#02-ABA669#001 fully qualified domain name of the manufacturer of a product using a | [URL] | 0..* |

| | | | |
|---|---|---|---|
| | universal resource identifier (URI) | | |
| [Property] GLN_of_manufacturer | [IRDI] 0173-1#02-AAY812#001 internationally unique identification number for the manufacturer of the device or the product and for the physical location | [INTEGER_COUNT] | 0..* |
| [Property] URI_of_the_product | [IRDI] 0173-1#02-ABH173#001 unique global identification of the product using an universal resource identifier (URI) | [URL] | [0..1 |
| [Property] URI_of_the_product | [IRDI] 0173-1#02-AAY811#001 unique global identification of the product using an universal resource identifier (URI) | [STRING_TRANSLATABLE_] | [0..1 |
| [Property] Date_of_manufacture | [IRDI] 0173-1#02-AAO686#001 Datum as of which a product, procedure, standard or similar entity is valid | [STRING] | 0..* |
| [Property] supplement_item_order \ _suffix_of_manufacturer | [IRDI] 0173-1#02-AAM547#002 by the manufacturer issued string for the identification of additional attributes, which can not be expressed by a structured manufacturer item number | [STRING_TRANSLATABLE_] | 0..* |
| [Property] item_name_of_manufacturer | [IRDI] 0173-1#02-AAM552#002 by the manufacturer (or distribution) set brand name for a product where product is a synonym for | [STRING_TRANSLATABLE_] | 0..* |

| | | | |
|---|---|---|---|
| | property, object, or service | | |
| [Property] item_type_of_manufacturer | [IRDI] 0173-1#02-AAN389#002 short name issued by the manufacturer or type detail as an additional detail to the product brand name, coded to be able to distinguish product items of a product family or special variants from each other | [STRING_TRANSLATABLE_] | 0..* |
| [Property] product_type_of_manufacturer | [IRDI] 0173-1#02-AAO681#003 additional information for describing products of a manufacturer for the purpose of distinguishing between products from a product family or of a special design (variants) | [STRING] | 0..* |
| [Property] product_designation \ _of_manufacturer | [IRDI] 0173-1#02-AAO682#003 designation used by the manufacturer for his product | [STRING] | 0..* |

## 3.8 Properties of the SMC “General technical data”

Table 9: Properties of SMC "General technical data"

| **idShort** | *General_technical_data* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-DVI205#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |

| idShort | Description@en | example | |
|---|---|---|---|
| [Property] Degree_of_protection \ _of_front_face | [IRDI] 0173-EX-1#02-WGW598#001 | [STRING] | 0..* |
| [Property] Degree_of_protection \ _of_terminals | [IRDI] 0173-EX-1#02-XSX546#001 | [STRING] | 0..* |
| [Property] Isolating_function | [IRDI] 0173-EX-1#02-RZC143#001 | [BOOLEAN] | 0..* |
| [Property] Provision_for_locking | [IRDI] 0173-EX-1#02-BNC928#001 | [BOOLEAN] | 0..* |
| [Property] Degree_of_protection \ _of_device | [IRDI] 0173-EX-1#02-XZW352#001 | [STRING] | 0..* |
| [Property] Kind_of_current | [IRDI] 0173-EX-1#02-ZJI199#001 | [STRING] | 0..* |
| [Property] Number_of_signal_lights | [IRDI] 0173-EX-1#02-GCK537#001 | [INTEGER_COUNT] | 0..* |
| [Property] Integrated_test_socket | [IRDI] 0173-EX-1#02-BMC909#001 | [BOOLEAN] | 0..* |
| [Property] Colour_of_light_indication | [IRDI] 0173-EX-1#02-BZW962#001 | [STRING] | 0..* |
| [Property] Material_of_protective_cover | [IRDI] 0173-EX-1#02-STQ350#001 | [STRING] | 0..* |
| [Property] Type_of_light_indication | [IRDI] 0173-EX-1#02-WJL444#001 | [STRING] | 0..* |
| [Property] Type_of_technology | [IRDI] 0173-EX-1#02-TIP743#001 | [STRING] | 0..* |
| [Property] Frequency_of_operating \ _cycles | [IRDI] 0173-EX-1#02-UZQ432#001 | [REAL_MEASURE] | 0..* |

## 3.9 Properties of the SMC “General”

Table 10: Properties of SMC "General"

| **idShort** | *General* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-SPA352#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Date_of_manufacture | [IRDI] 0173-1#02-AAR972#002 Date from which the production and / or development process is completed or from which a service is provided completely | [DATE] | 0..* |
| [Property] Type_designation | [IRDI] 0173-EX-1#02-CKG667#001 | [STRING] | 0..* |
| [Property] Type | [IRDI] 0173-EX-1#02-QLP827#001 | [STRING] | 0..* |
| [Property] Variant | [IRDI] 0173-EX-1#02-XLN508#001 | [STRING] | 0..* |
| [Property] country_of_origin | [IRDI] 0173-1#02-AAO995#001 country, in which the good is produced or mainly processed | [STRING] | 0..* |
| [Property] Manufacturer | [IRDI] 0173-1#02-AAV772#001 Designation of the natural or judicial person which is responsible for the production of a product in respect to its being brought into circulation on its own account | [STRING] | 0..* |

## 3.10 Properties of the SMC “Fire safety”

Table 11: Properties of SMC " Fire safety"

| **idShort** | *Fire_safety* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-PUZ306#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Material_flammability_class | [IRDI] 0173-EX-1#02-LDL480#001 | [STRING] | 0..* |

## 3.11 Properties of the SMC “Installation mounting and dimension”

Table 12: Properties of SMC "Installation mounting and dimension"

| **idShort** | *Installation_mounting_and_dimension* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-EON193#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Height | [IRDI] 0173-1#02-BAF419#004<br>The dimension of objects with preferred position of use, which is generally measured oriented to gravity and generally measured perpendicular to the supporting surface | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| [Property]<br>Width | [IRDI] 0173-1#02-BAF016#006<br>for objects with orientation in preferred position during use the dimension perpendicular to height/ length/depth | [REAL_MEASURE] | 0..* |
| [Property]<br>Length | [IRDI] 0173-1#02-BAF558#004<br>The greatest extent of the object between two established points | [REAL_MEASURE] | 0..* |
| [Property]<br>Product_mass | [IRDI] 0173-EX-1#02-JPV325#001 | [REAL_MEASURE] | 0..* |
| [Property]<br>suitable_for_mounting \<br>_onto_standard_rails | [IRDI] 0173-1#02-AAB667#007]<br>Operating unit can be mounted onto standard rails | [BOOLEAN] | [0..1 |
| [Property]<br>Mounting_of_the_device | [IRDI] 0173-EX-1#02-LZX558#001 | [STRING] | 0..* |
| [Property]<br>Panel_mounting | [IRDI] 0173-EX-1#02-YBC991#001 | [STRING] | 0..* |
| [Property]<br>Closing_plate_required | [IRDI] 0173-1#02-BAD774#008]<br>whether closing plate required for serial terminals or strip terminal | [BOOLEAN] | [0..1 |
| [Property]<br>With_protective_hood | [IRDI] 0173-EX-1#02-HDZ501#001 | [BOOLEAN] | 0..* |

## 3.12 Properties of the SMC “Contact”

Table 13: Properties of SMC "Contact"

| | |
|---|---|
| **idShort** | *Contact* |
| **Class** | SubmodelElementCollection |
| **semanticId** | 0173-EX-1#02-XGE201#001 |
| **isCaseOf** | |
| **AllowDuplicates** | True |
| **Explanation** | |

| [SME type] | semanticity = [idType]value | [valueType] | card. |
|---|---|---|---|
| **idShort** | **Description@en** | **example** | |
| [Property] Categories_of_application \ _of_contacts | [IRDI] 0173-EX-1#02-CYY324#001 | [STRING] | 0..* |
| [Property] Break_contact_NC_ | [IRDI] 0173-EX-1#02-AKF084#001 | [INTEGER_COUNT] | 0..* |
| [Property] Limiting_breaking_capacity | [IRDI] 0173-EX-1#02-DRS318#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_switching_current | [IRDI] 0173-EX-1#02-KNX954#001 | [REAL_MEASURE] | 0..* |
| [Property] Make_contact_NO_ | [IRDI] 0173-EX-1#02-XAL473#001 | [INTEGER_COUNT] | 0..* |
| [Property] Limiting_making_capacity | [IRDI] 0173-EX-1#02-LKG039#001 | [REAL_MEASURE] | 0..* |
| [Property] Making_capacity_ | [IRDI] 0173-EX-1#02-JLB419#001 | [REAL_MEASURE] | 0..* |
| [Property] Limiting_continuous_current | [IRDI] 0173-EX-1#02-NJG328#001 | [REAL_MEASURE] | 0..* |
| [Property] Limiting_continuous_current \ _of_an_output_circuit | [IRDI] 0173-EX-1#02-UHM655#001 | [REAL_MEASURE] | 0..* |
| [Property] Limiting_short_time_current \ _of_an_output_circuit | [IRDI] 0173-EX-1#02-HFB697#001 | [REAL_MEASURE] | 0..* |
| [Property] Contact_gap | [IRDI] 0173-EX-1#02-EPO103#001 | [REAL_MEASURE] | 0..* |
| [Property] Contact_type | [IRDI] 0173-1#02-AAS468#001 Description of component types that are used to create electrically conductive connections | [STRING_TRANSLATABLE_] | 0..* |
| [Property] Contact_categories | [IRDI] 0173-EX-1#02-CMK988#001 | [STRING_TRANSLATABLE_] | 0..* |
| [Property] Contact_load_categories | [IRDI] 0173-EX-1#02-ZWF224#001 | [STRING_TRANSLATABLE_] | 0..* |
| [Property] Contact_load_categories | [IRDI] 0173-EX-1#02-ZNX225#001 | [STRING_TRANSLATABLE_] | 0..* |
| [Property] Contact_material | [IRDI] 0173-1#02-AAM714#001 | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| | Material of which the contact is made | | |
| [Property] Short_circuit_resistance_ | [IRDI] 0173-EX-1#02-EZM782#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_switching_power | [IRDI] 0173-EX-1#02-SBB112#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_switching_capacity | [IRDI] 0173-EX-1#02-NJQ617#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_switching_capacity | [IRDI] 0173-EX-1#02-IKL857#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_switching_voltage | [IRDI] 0173-EX-1#02-GNZ540#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_switching_voltage | [IRDI] 0173-EX-1#02-AEL253#001 | [REAL_MEASURE] | 0..* |
| [Property] Peak_inrush_current | [IRDI] 0173-EX-1#02-LAY263#001 | [REAL_MEASURE] | 0..* |
| [Property] Change_over_contact_CO_ | [IRDI] 0173-EX-1#02-FTQ019#001 | [INTEGER_COUNT] | 0..* |
| [Property] Change_over_make \ _before_break_contact | [IRDI] 0173-EX-1#02-OUF389#001 | [INTEGER_COUNT] | 0..* |
| [Property] Rated_contact_load | [IRDI] 0173-EX-1#02-UCC882#001 | [REAL_MEASURE] | 0..* |
| [Property] Maximum_switching_power | [IRDI] 0173-EX-1#02-NYJ785#001 | [REAL_MEASURE] | 0..* |
| [Property] Minimum_applicable_load | [IRDI] 0173-EX-1#02-TJU579#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_frequency | [IRDI] 0173-EX-1#02-BIL771#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_frequency | [IRDI] 0173-EX-1#02-FKZ500#001 | [REAL_MEASURE] | 0..* |
| [Property] Maximum_switching_current | [IRDI] 0173-EX-1#02-GRD158#001 | [REAL_MEASURE] | 0..* |
| [Property] Maximum_switching_voltage | [IRDI] 0173-EX-1#02-DQR575#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_conditional \ _short_circuit_current | [IRDI] 0173-EX-1#02-SNM463#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_making_current_capacity | [IRDI] 0173-EX-1#02-SLR309#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_breaking_current_capacity | [IRDI] 0173-EX-1#02-SZQ580#001 | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| [Property]<br>Rated_operational_voltage_Ue | [IRDI] 0173-EX-1#02-XQE679#001 | [REAL_MEASURE] | 0..* |
| [Property]<br>Rated_operational_current_Ie | [IRDI] 0173-EX-1#02-SAW020#001 | [REAL_MEASURE] | 0..* |
| [Property]<br>B10_value | [IRDI] 0173-EX-1#02-VFV703#001<br>number of cycles in which component has failed | [INTEGER_COUNT] | 0..* |
| [Property]<br>B10D | [IRDI] 0173-1#02-ABC481#001<br>number of expected cycles until 10 % of the population has turned out dangerous | [INTEGER_COUNT] | 0..* |
| [Property]<br>Contact_surface | [IRDI] 0173-EX-1#02-UBU998#001 | [STRING_TRANSLATABLE_] | 0..* |
| [Property]<br>Contact_body_material | [IRDI] 0173-EX-1#02-VLP701#001 | [STRING] | 0..* |
| [Property]<br>Switching_element_function | [IRDI] 0173-EX-1#02-QQS153#001 | [STRING] | 0..* |
| [Property]<br>Switching_capacity_DC_13 | [IRDI] 0173-EX-1#02-APS735#001 | [REAL_MEASURE] | 0..* |
| [Property]<br>Rated_voltage | [IRDI] 0173-1#02-AAZ483#001<br>manufacturer's value for the voltage, which is derived from measured values that have been obtained under established conditions and rules | [REAL_MEASURE] | 0..* |
| [Property]<br>max_switching_voltage | [IRDI] 0173-1#02-AAF715#003<br>maximum voltage between the contact pieces before the closing or after the opening | [REAL_MEASURE] | 0..* |
| [Property]<br>breaking_capacity | [IRDI] 0173-1#02-AAG459#003<br>countervoltage resulting from the deactivation/breaking and caused by a circuit | [REAL_MEASURE] | 0..* |
| [Property]<br>Double_opening_of_the_circuit | [IRDI] 0173-EX-1#02-RPU017#001 | [BOOLEAN] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Change_over_break \ _before_make_contact | [IRDI] 0173-EX-1#02-AJN150#001 | [INTEGER_COUNT] | 0..* |
| [Property] Switching_capacity_AC_1 | [IRDI] 0173-EX-1#02-FYR909#001 | [REAL_MEASURE] | 0..* |
| [Property] Switching_capacity_AC_15 | [IRDI] 0173-EX-1#02-CHW866#001 | [REAL_MEASURE] | 0..* |

## 3.13 Properties of the SMC “Connection”

Table 14: Properties of SMC "Connection"

| **idShort** | *Connection* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-SPY810#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Connection_unit | [IRDI] 0173-EX-1#02-JFC859#001 | [STRING] | 0..* |
| [Property] Connection_unit_of_auxiliary \ _and_or_control_circuits | [IRDI] 0173-EX-1#02-ZRY317#001 | [STRING] | 0..* |
| [Property] Rated_cross_section | [IRDI] 0173-EX-1#02-IIF787#001 | [REAL_MEASURE] | 0..* |
| [Property] Cross_section_in_AWG_or_kcmil_size | [IRDI] 0173-EX-1#02-KRP494#001 | [STRING] | 0..* |
| [Property] Cross_section_of_flexible_conductor | [IRDI] 0173-EX-1#02-LHL156#001 | [REAL_MEASURE] | 0..* |
| [Property] Cross_section_of_flexible_conductor \ _in_AWG_or_kcmil_size_minimum | [IRDI] 0173-EX-1#02-FIY853#001 | [STRING] | 0..* |
| [Property] Cross_section_of_flexible_conductor \ _in_AWG_or_kcmil_size_maximum | [IRDI] 0173-EX-1#02-VCL264#001 | [STRING] | 0..* |
| [Property] Cross_section_of_rigid_conductor | [IRDI] 0173-EX-1#02-SRU794#001 | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Cross_section_of_rigid_conductor \ _in_AWG_or_kcmil_size_minimum | [IRDI] 0173-EX-1#02-CQC171#001 | [STRING] | 0..* |
| [Property] Cross_section_of_rigid_conductor \ _in_AWG_or_kcmil_size_maximum | [IRDI] 0173-EX-1#02-NGS196#001 | [STRING] | 0..* |
| [Property] Number_of_wiring_terminals | [IRDI] 0173-EX-1#02-JAI358#001 | [INTEGER_COUNT] | 0..* |
| [Property] Cross_section_of_flexible_conductor \ _with_insulated_ferrule | [IRDI] 0173-EX-1#02-RTT030#001 | [REAL_MEASURE] | 0..* |
| [Property] Cross_section_of_flexible_conductor \ _with_insulated_ferrule_in_AWG_or \ _kcmil_size_minimum | [IRDI] 0173-EX-1#02-NCI787#001 | [STRING] | 0..* |
| [Property] Cross_section_of_flexible_conductor \ _with_insulated_ferrule_in_AWG_or \ _kcmil_size_maximum | [IRDI] 0173-EX-1#02-GDV945#001 | [STRING] | 0..* |
| [Property] Strip_length | [IRDI] 0173-EX-1#02-EEP489#001 | [REAL_MEASURE] | 0..* |

## 3.14 Properties of the SMC “Coil”

Table 15: Properties of SMC "Coil"

| **idShort** | *Coil* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-XZV809#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Upper_limit_of_the \ _rated_coil_voltage | [IRDI] 0173-EX-1#02-RYQ593#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_of_the \ _rated_coil_voltage | [IRDI] 0173-EX-1#02-OAZ756#001 | [REAL_MEASURE] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Upper_operative_limit \ _of_a_relay_coil | [IRDI] 0173-EX-1#02-IOR239#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_operative_limit \ _of_a_relay_coil | [IRDI] 0173-EX-1#02-FQY275#001 | [REAL_MEASURE] | 0..* |
| [Property] rated_power_of_the_input \ _circuit_of_the_coil | [IRDI] 0173-EX-1#02-XYK857#001 | [REAL_MEASURE] | 0..* |
| [Property] Input_voltage | [IRDI] 0173-1#02-BAC200#007] Voltage at the input connection of the control circuit of a switching device | [REAL_MEASURE] | 0..* |
| [Property] Rated_coil_voltage | [IRDI] 0173-EX-1#02-PJH664#001 | [REAL_MEASURE] | 0..* |
| [Property] Upper_limit_rated_coil_voltage | [IRDI] 0173-EX-1#02-MXA977#001 | [REAL_MEASURE] | 0..* |
| [Property] Lower_limit_rated_coil_voltage | [IRDI] 0173-EX-1#02-FNR189#001 | [REAL_MEASURE] | 0..* |
| [Property] Coil_limiting_temperature | [IRDI] 0173-EX-1#02-CVA902#001 | [REAL_MEASURE] | 0..* |
| [Property] Nominal_coil_voltage | [IRDI] 0173-EX-1#02-JMR551#001 | [REAL_MEASURE] | 0..* |
| [Property] limiting_voltage | [IRDI] 0173-EX-1#02-CRH594#001 | [REAL_MEASURE] | 0..* |
| [Property] Rated_coil_power | [IRDI] 0173-EX-1#02-WRC572#001 | [REAL_MEASURE] | 0..* |
| [Property] Non_polarized_relay | [IRDI] 0173-EX-1#02-HOK753#001 | [BOOLEAN] | 0..* |
| [Property] Polarized_relay | [IRDI] 0173-EX-1#02-FRU023#001 | [BOOLEAN] | 0..* |
| [Property] Operating_function | [IRDI] 0173-EX-1#02-QNK698#001 | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Operating_current_ac_ | [IRDI] 0173-EX-1#02-XZV147#001 | [REAL_MEASURE] | 0..* |
| [Property] Operating_current_dc_ | [IRDI] 0173-EX-1#02-COX215#001 | [REAL_MEASURE] | 0..* |
| [Property] operating_voltage_AC | [IRDI] 0173-1#02-ABD344#001<br>AC voltage which is necessary to operate the device | [REAL_MEASURE] | 0..* |
| [Property] operating_voltage_DC | [IRDI] 0173-1#02-ABD345#001<br>DC voltage which is necessary to operate the device | [REAL_MEASURE] | 0..* |
| [Property] Number_of_primary_coils | [IRDI] 0173-EX-1#02-KEB439#001 | [INTEGER_COUNT] | 0..* |
| [Property] Coil_insulation_system \ _according_UL | [IRDI] 0173-EX-1#02-MSB684#001 | [STRING] | 0..* |

## 3.15 Properties of the SMC “Case”

Table 16: Properties of SMC "Case"

| **idShort** | *Case* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-BXT746#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Categories_of \ _environmental_protection_RT_ | [IRDI] 0173-EX-1#02-TWB104#001 | [STRING] | 0..* |
| [Property] Relay_technology_categories | [IRDI] 0173-EX-1#02-MCV116#001 | [STRING] | 0..* |

| | | | |
|---|---|---|---|
| [Property] Housing_or_body_material | [IRDI] 0173-EX-1#02-XQK529#001 | [STRING] | 0..* |
| [Property] Colour_of_the_device_body | [IRDI] 0173-EX-1#02-LOO009#001 | [STRING] | 0..* |
| [Property] Colour_of_the_cover | [IRDI] 0173-EX-1#02-YOZ885#001 | [STRING] | 0..* |

## 3.16 Properties of the SMC “Approval”

Table 17: Properties of SMC "Approval"

| **idShort** | *Approval* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-SWE350#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Approbation | [IRDI] 0173-EX-1#02-GPR275#001 | [STRING] | 0..* |

## 3.17 Properties of the SMC “Accessoires”

Table 18: Properties of SMC "Accessoires"

| **idShort** | *Accessoires* | | |
|---|---|---|---|
| **Class** | SubmodelElementCollection | | |
| **semanticId** | 0173-EX-1#02-CJV876#001 | | |
| **isCaseOf** | | | |
| **AllowDuplicates** | True | | |
| **Explanation** | | | |
| **[SME type]** | **semanticity = [idType]value** | **[valueType]** | **card.** |
| **idShort** | **Description@en** | **example** | |
| [Property] Accessoires | [IRDI] 0173-EX-1#02-LLH727#001 | [STRING] | 0..* |

## 3.18 Additional notes and outlook

This AAS submodel provides a proof of concept that the technical description of switching relays can be mapped in an AAS submodel. This is an initial version that needs to be expanded. This means, this is the first draft version for productive usage.

During creation, the focus was on the submodel collections or blocks in order to bundle further semantic structural elements.

Materials and environmental data are not considered and the AAS are to be referenced later.

Polymorphism in accordance with IEC 61360 is desired for the "IsoKo" block. This is not possible in an AAS. It was therefore modeled as a cardinal block.

The "types of contacts" such as "break, make, change over" are missing; this must be subsequently modeled in a further version

# Annex A: Explanations on used table formats

General
The used tables in this document try to outline information as concise as possible. They do not convey all information on Submodels and SubmodelElements. For this purpose, the definitive definitions are given by a separate file in form of an AASX file of the Submodel template and its elements.

Tables on Submodels and SubmodelElements
For clarity and brevity, a set of rules is used for the tables for describing Submodels and SubmodelElements.

- The tables follow in principle the same conventions as in [5].
- The table heads abbreviate 'cardinality' with 'card'.
- The tables often place two informations in different rows of the same table cell. In this case, the first information is marked out by sharp brackets [] form the second information. A special case are the semanticIds, which are marked out by the format: (type)(local)[idType]value.
- The types of SubmodelElements are abbreviated: SME

| **SME type Submodel** | **Element type** |
|---|---|
| Property | Property |
| MLP | MultiLanguageProperty |
| Range | Range |
| File | File |
| Blob | Blob |
| Ref | ReferenceElement |
| Rel | RelationshipElement |
| SMC | SubmodelElementCollection |

- If an idShort ends with '{00}', this indicates a suffix of the respective length (here: 2) of decimal digits, in order to make the idShort unique. A different idShort might be choosen, as long as it is unique in the parent's context.
- The Keys of semanticId in the main section feature only idType and value, such as: [IRI]https://admin-shell.io/vdi/2770/1/0/DocumentId/Id. The attributes "type" and "local" (typically "ConceptDescription" and "(local)" or "GlobalReference" and (no-local)") need to be set accordingly; see [6].
- If a table does not contain a column with "parent" heading, all represented attributes share the same parent. This parent is denoted in the head of the table.
- Multi-language strings are represented by the text value, followed by '@'-character and the ISO 639 language code: example@de.
- The [valueType] is only given for Properties.

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